Visual Cues to Portion Sizes: The Role of Conservation?

Margaret Anne Defeyter

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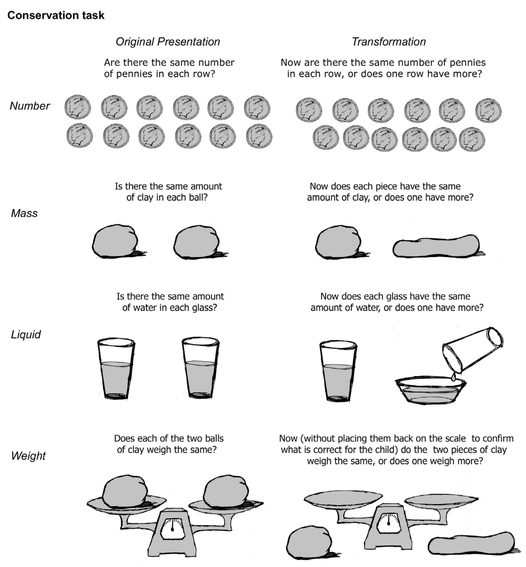
Introduction

▪Young children have the ability to regulate intake both within meals and throughout the course of the day (e.g. Birch et al., 1993)

▪Five-year-old children's ability to self-regulate is subject to modification by social and environmental factors (Rolls et al., 2000).

▪Conservation Tasks: To understand conservation the child must recognise that certain characteristics of an object remain the same even when their appearance changes.



▪To illustrate: Children are shown two glasses of liquid. Once the child has agreed that both glasses contain the same amount of liquid, the water from one glass is poured into a shorter, wider glass.

▪Children are then asked whether there is the same amount of liquid in both glasses or whether one has more liquid. Below the ages of 6 or 7 children often reply that the taller glass contains more liquid. In other words they lack the knowledge that the volume of water is conserved.

Experiment 1:

Design: A between-subjects design with one factor and two-levels (wide and short cereal bowl vs. narrow and tall bowl).

Participants: 40 children (mean age = 5.6, range 5- 6.3; 18 males and 22 females) were recruited from primary schools in the North East of England. Children were pseudo-randomly allocated to condition by gender and age. No children had consumed any food on the morning prior to test.

Procedure:

▪Children were individually tested on a Piagetian conservation of volume task by pouring a single size portion of cereal (Cornflakes) into two same-size bowls. The portion of cereal was poured from an individual box.

▪Once children agreed that the bowls contained the same amount of cereal the experimenter poured the cereal from one bowl into a narrower bowl.

At Test all children stated that the narrower bowl contained a larger portion of cereal.

Following the test question, according to condition, children were given one of the bowls of cereal to eat, accompanied by 125 ml of semi-skimmed milk.

Results:

Pre-test hunger and liking ratings did not differ between groups.

•Thirty minutes following breakfast consumption children in the tall bowl condition reported that they were more sated than those in the short bowl condition (t (38) = 2.56, $p < 0.05$).

•Children in the tall bowl condition reported that they were less hungry than those in the short bowl condition (t(38) = 3.12,$p < 0.01$).

Discussion:

•Although both groups of children consumed exactly the same amount of cereal, there were significant differences between the groups in terms of hunger and satiety.

•These findings suggest that five-year-old children's reliance on visual cues may effect their ratings of hunger and satiety.

Experiment 2:

•Recently Geier et al. (2006) proposed a new heuristic (unit bias) to explain why small portion sizes are effective in controlling consumption in adults.

•However, it is not clear as to whether such a bias operates in young children; and how this bias operates when examining portion sizes of amorphous foods, such as cereal.

•Prediction: If children pay attention to height rather than volume, the height of the cereal from the top of the bowl should not differ as a factor of bowl size.

Design: A within-subjects design with one factor and two-levels (wide and short cereal bowl vs. narrow and tall bowl).

Participants: 20 children (mean age = 5.6, range 5. 2- 6.0; 10 males and 10 females) were recruited from schools running breakfast clubs in the North East of England. No children had participated in Experiment 1, and no children consumed any food prior to test.

Procedure:

Test Phase 1: Over the course of five days, children served themselves a portion of Cornflakes from a plastic container Following the addition of milk to the cereal, the height of the cereal from the top of the bowl was measured. After children had finished breakfast the bowl was weighed to determine the amount of food left over.

Test Phase 2: One month later, a different researcher returned to the breakfast club and the procedure was repeated, apart from the fact that the volume of the bowls was increased by 20%. The order of bowl size was counterbalanced across two school-breakfast clubs.

Results:

A repeated-measures Anova showed no difference in the height of the cereal from the top of the bowl across conditions (F(1,19) = 1.80, $p > 0.05$).

There was also no significant difference in the weight of food left over across conditions (F(1,19) = 2.44, $p > 0.05$).

Table 1: Mean height (cm) of cereal and mean weight of food (g) left according to condition.

	Height of Cereal from top of bowl (cm)	Amount of food left (g)
Small Bowl	2.03 (0.43)	3.20 (4.40)
Large Bowl	2.31 (0.33)	2.45 (3.30)

Discussion:

These results suggest that children appealed to the height for the food to determine a unit (portion size). Children consumed more in the large bowl condition than in the small bowl condition; perhaps due to social norms.

References:

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